

REMARKS

In the Office Action dated February 13, 2007, the drawings were objected to under 37 C.F.R. §1.83(a) because the Examiner stated the means by which the attachment arrangement of the module to the hearing aid processor recess is fixedly connected, or detachably connected, or made to damp vibrations, must be shown in the drawings.

Applicants assume that this objection stems from the statement in claim 17 that the hearing aid signal processor has a recess therein in which the module is received. This statement in claim 17 arose due to a translation error. As clearly shown in Figure 1 and as described at page 6 of the present specification, the module is actually received in a recess in the hearing aid itself, namely in the hearing aid housing, and the hearing aid processing unit has no recess. Claim 17 has been amended to correct this error, and therefore this also makes the drawing objection Moot.

The Examiner also noted a typographical in the specification, and this has been corrected by changing the reference numeral in the specification designating the plug contacts from "27" to --26--.

Claim 17 was objected to on a basis similar to the basis for the drawing objections, and Applicants the aforementioned amendment to claim 17 overcomes this claim objection. Claim 18 has been consistently amended and is submitted to be in proper dependent form in conformity with the requirements of 37 C.F.R. §1.75(c).

Claims 26-28 were rejected under Section 112, first paragraph as failing to comply with the enabling requirement, because the specification and drawings do

not disclose how the attachment arrangement is made to be fixedly connected, detachably connected or connected in a way to dampen vibrations.

It is not clear whether this objection was made because of the dependency of claims 26 through 28 on claim 17 (through dependent claim 25), or whether the Examiner generally believes the specification is non-enabling with regard to the subject matter of those claims, regardless of where the module is received. If it is the former case, then the aforementioned amendment to claim 17 overcomes this rejection. If it is the latter case, Applicants submit that the specification at page 6 is fully enabling for a person of ordinary skill in the field of hearing aid design and construction to employ suitable mounting and damping arrangements and materials in conformity with the subject matter of claims 25-28. As described at page 6, the unit 7, which is the aforementioned module, can be isolated from vibration with damping materials 9. Those of ordinary skill in the field of hearing aid design and construction are very familiar with suitable types of damping materials for this purpose. The alternative of the module being attachable and detachable in the recess of the hearing aid housing is also well within the skill of persons knowledgeable with regard to hearing aid design and construction. For example, the module can be simply tightly inserted in the recess with a press fit, so as to allow it to be removed (detached) as needed. Alternatively, the module can be held in place with suitable adhesive or other types of attachment elements.

Applicants therefore submit that the subject matter of claims 25-28 is properly supported in the specification as originally filed in compliance with all requirements of Section 12, first paragraph. If the Examiner believes there are reasons why a person of ordinary skill in the field of hearing aid design and construction could not

make use of this information in the specification to construct the subject matter of claims 25-26, the Examiner is requested to identify any alleged deficiencies or construction problems in detail, and Applicants will be glad to respond thereto.

Claims 1-3, 8-13 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Aceti et al in view of Gao et al.

This rejection is respectfully traversed for the following reasons.

The Examiner acknowledged that the Aceti et al reference does not disclose a module signal processing unit that suppresses feedback between an electro-acoustical transducer and an acoustical electrical transducer, with the module signal processing unit being in the same module with those transducers. The Examiner relied on the Gao et al reference as disclosing feedback-cancelling circuitry for use in a hearing aid, and the Examiner stated it would have been obvious to a person of ordinary skill in the art to use the feedback cancelling circuitry of Gao et al in the module of Aceti et al , in order to provide less distortion and improve the quality of sound.

Applicants acknowledge that the Aceti et al reference discloses a module that can be mounted in a hearing aid housing, wherein the module has an electro-acoustical transducer and an acousto-electrical transducer. The Examiner has acknowledged that the Aceti et al reference does not state that these transducers in Aceti et al have feedback associated therewith, but the Examiner has assumed that such feedback is inherent. Applicants agree that such feedback is inherent, but the complete absence of any discussion thereof in the Aceti reference is extremely important to assessing the non-obviousness of modifying the Aceti et al reference in order to suppress such feedback, whether such modification occurs (allegedly) on

the basis of the teachings of Gao et al, or any other reference. Most importantly, the electronics module 12 disclosed in the Aceti et al reference has several components other than the aforementioned transducers. The electronics module 12 in the Aceti reference includes signal processing circuitry 20, and a battery 24, the signal processing circuitry 20 including components 28. As stated at column 2, lines 43-44, the signal processing circuitry 20 is of a known type, and provides the desired amplification. This makes it clear that the signal processing circuitry 20 in the electronics module 12 in Aceti et al is intended to be the overall signal processing circuit for the hearing aid. This is relevant to the subject matter of claim 17, because claim 17 of the present application claims not only a signal processor in the module, but also a hearing aid signal processor that is outside of the module, and that is mechanically and electrically connected to the module.

Even with regard to independent claim 1, however, wherein only the signal processing unit in the module is claimed, this still does not conform to the disclosure of Aceti et al, even if modified in accordance with the teachings of Gao et al. Each of claims 1 and 17 has been amended to state that the module contains only the aforementioned transducers and the module signal processing unit. Moreover, the feedback that exists between the transducers and the modules has been stated in claims 1 and 17 to be substantially fixed, due to those transducers being pre-combined. The present inventors have had the insight to recognize that by pre-combining the transducers, and thereby substantially fixing the feedback therebetween, the suppression of this feedback can be much more easily accomplished by placing a processor in the same module with those transducers that is pre-programmed to suppress the substantially fixed feedback.

As the Examiner has noted, the Gao et al reference discloses conventional feedback suppression or cancelling in a hearing aid. Although a line designated "feedback path" is shown in many of the figures in Gao et al, this is merely a schematic indication of the occurrence of feedback. As is well known to those of ordinary skill in the field of hearing aid design and construction, many possible feedback paths exist in a hearing aid and it is a difficult problem to devise an algorithm that is capable of responding to and suppressing feedback among such multiple feedback paths. Although this can be accomplished using known methods to a certain extent, such suppression, because the feedback is unknown and unpredictable, requires relatively intensive computational algorithms, that must also quickly respond when a new and unexpected feedback path arises.

Only the present Applicants have had the insight to recognize that by pre-combining the input transducer and the output transducer in a module, this essentially fixes the feedback between those components, and therefore suppression of this feedback can be relatively easily accomplished by pre-programming a signal processor that is also contained in the module.

Moreover, as set forth in claim 17, the signal processor that is programmed to suppress the substantially fixed feedback is different from the hearing aid signal processor that is used for other purposes, such as for amplification and adapting the hearing aid to a particular acoustic environment.

Even if, with hindsight after reading the present disclosure, it is possible to recognize that the feedback between the acousto-electrical transducer and the electro-acoustical transducer in the Aceti et al reference is substantially fixed, Aceti et al clearly did not have the insight to recognize this possibility, and therefore did not

disclose any feedback suppression techniques to take advantage of such a substantially fixed feedback. Moreover, the feedback suppression or cancelling algorithms disclosed in the Gao et al reference proceed on the assumption that the feedback that is being suppressed or cancelled will not be substantially fixed, otherwise the elaborate and complicated procedures for suppressing or cancelling the feedback that are disclosed in the Gao et al reference would not be necessary.

Applicants therefore respectfully submit that even if the Aceti et al hearing aid were modified in accordance with the teachings of Gao et al, the subject matter of claim 1 still would not result, and therefore claim 1, nor any of claims 2, 3, 8-13 or 15 depending therefrom, would not have been obvious to a person of ordinary skill in the field of hearing aid design and construction under the provisions of 35 U.S.C. §103(a) based on the teachings of those references.

All of the other claims of the application were rejected under 35 U.S.C. §103(a) based on various combinations of references, all of which were based on the Aceti et al/Gao et al combination, together with additional ternary or tertiary references. Applicants submit the above arguments with regard to the Aceti et al/Gao et al combination are applicable to all of these further rejections under 35 U.S.C. §103(a). In view of the deficiencies of this basic combination of the teachings of Aceti et al and Gao et al, Applicants submit that even if the Examiner is correct with regard to the teachings of the ternary and tertiary references, modifying the Aceti et al/Gao et al combination in accordance with the teachings of those additional references still would not result in the subject matter of any of the dependent claims, nor in the subject matter of independent claim 17.

All claims of the application are therefore submitted to be in condition for allowance, and early consideration of the application is respectfully requested.

Submitted by,



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